

CLAIMS:

1. An interface integrated circuit device for interfacing a USB connection to a further circuit, the interface integrated circuit comprising:
 - first external terminals for connecting to a USB bus;
 - a transceiver capable of transceiving for both a USB host and a USB device,
 - 5 the transceiver having a USB interface, a host interface and a device interface, the USB interface being coupled to the first external terminals;
 - second external terminals coupled to the device interface for connection to an external USB device controller;
 - a host controller coupled to the host interface, the host controller having a
 - 10 parallel data/address bus;
 - third external terminals coupled to the parallel data/address bus.
2. An integrated circuit device according to Claim 1, wherein the device interface comprises both an analog USB device interface and a transceived digital USB device
- 15 interface for connection to an external USB device controller without and with an external transceiver, respectively.
3. An electronic apparatus with a USB connection, the electronic apparatus comprising a functional circuit with a processor, a parallel address data bus coupled to the
- 20 processor and a USB device controller circuit with a USB interface in parallel with said address/data bus, the apparatus comprising an interface integrated circuit electronically between the USB connection on the one hand and the parallel address/data interface and the USB interface on the other hand, the interface integrated circuit comprising:
 - first external terminals for connecting to the USB connection;
 - 25 - a transceiver capable of transceiving for both a USB host and a USB device, the transceiver having a USB interface, a host interface and a device interface, the USB interface being coupled to the first external terminals;
 - the device interface being connected to the USB device controller circuit in said functional circuit;

- a host controller coupled to the host interface, the host controller being coupled to the processor via the parallel data/address bus.

4. An electronic apparatus according to Claim 3, wherein the apparatus is arranged to use USB communication from said host controller via the USB connection in a first speed mode when operating as USB host and to use USB communication via the USB connection in a second speed mode, different from said first speed mode, as determined by the device controller when operating as USB device.

5. An electronic system comprising one or more USB bus connections, a host apparatus and a device apparatus, at least one of the host and the device apparatus comprising a functional circuit with a processor, a parallel address data bus coupled to the processor and a USB device controller circuit with a USB interface in parallel with said address/data bus, the apparatus comprising an interface integrated circuit electronically between the USB connection on the one hand and the parallel address/data interface and the USB interface on the other hand, the interface integrated circuit comprising:

- first external terminals for connecting to a USB bus connection;
- a transceiver capable of transceiving for both a USB host and a USB device, the transceiver having a USB interface, a host interface and a device interface, the USB interface being coupled to the first external terminals;
- the device interface being connected to the external USB device controller circuit;
- a host controller coupled to the host interface, the host controller being coupled to the processor via the parallel data/address bus.

6. A method of operating an interface integrated in a USB system, the method comprising:

- receiving a selection whether the apparatus containing the interface integrated circuit should operate as a USB host or as a USB device;
- transceiving USB signals with a transceiver in the interface integrated circuit;
- sequencing USB communication via the transceiver with a host controller in the interface integrated circuit and communicating USB transceived data to or from functional circuits outside the integrated circuit via a parallel address data interface when USB host operation is selected, and

- passing USB signals from the transceiver to a device controller in the functional circuits outside the integrated circuit when USB device controller operation is required.